FIG. 1A

FROM HEADEND 11

ANALOG
TRANSMISSION SIGNALS

60

BROADCAST DIGITAL
TRANSMISSION SIGNALS

64

CAROUSEL DIGITAL
TRANSMISSION SIGNALS

68

ON DEMAND DIGITAL
TRANSMISSION SIGNALS

72

TUNER
SYSTEM

DHCT 16

76

80

UPSTREAM
OOB (RDS)

DOWNSTREAM
OOB (FDS)

HEADEND
11

FIG. 1B

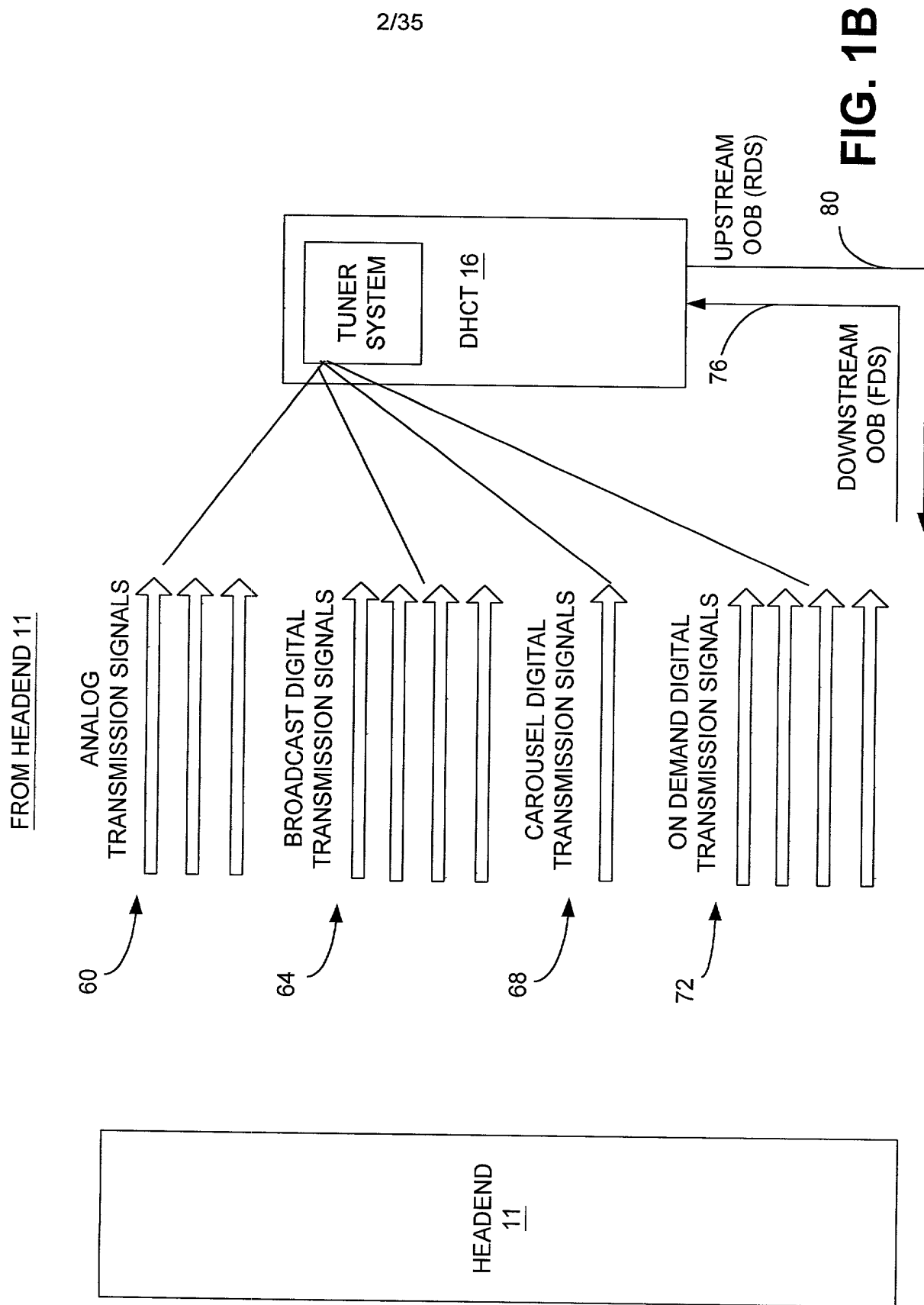**FIG. 2**
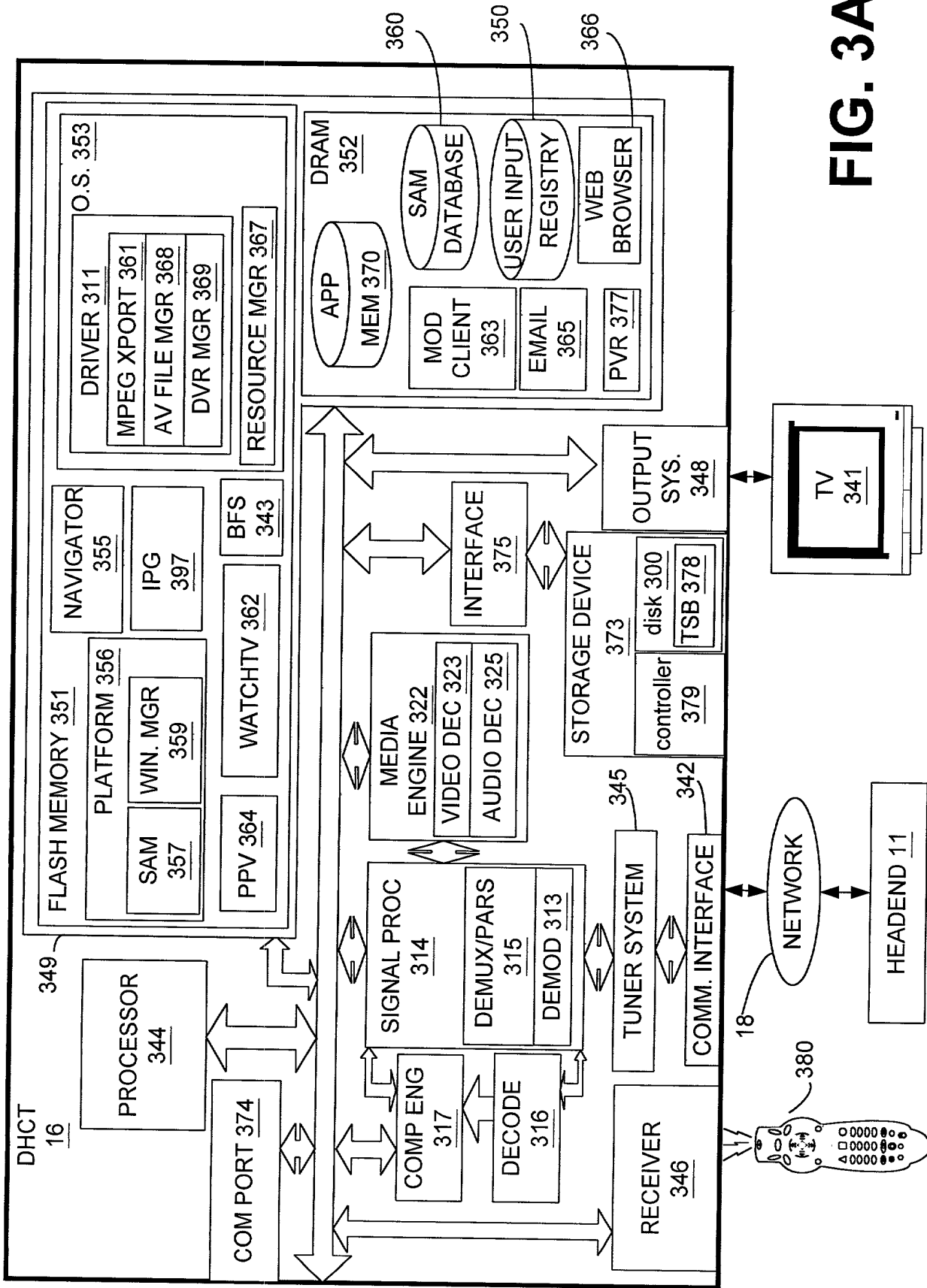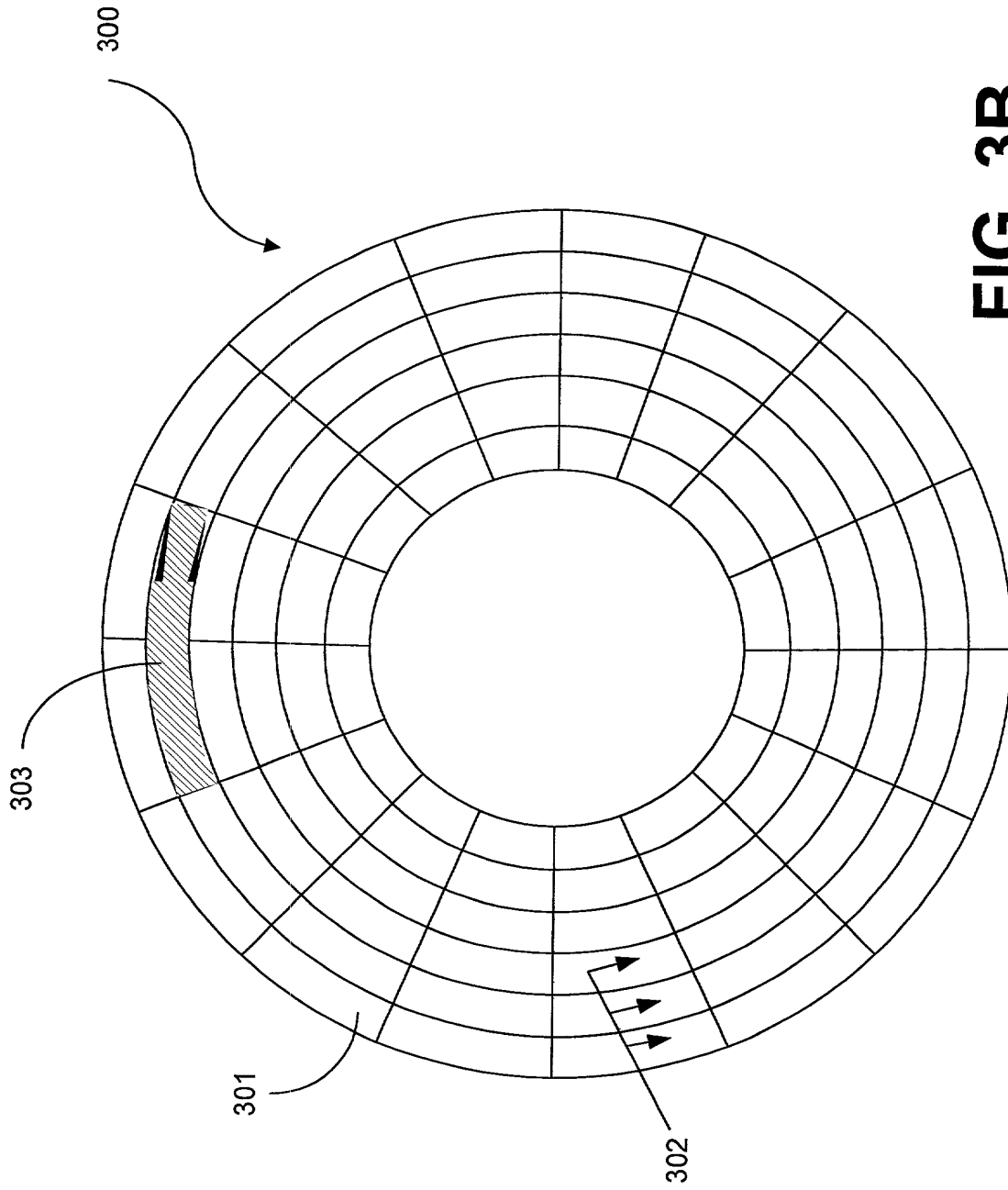
FIG. 3A

FIG. 3B

```
struct ProgramInfo
{
    char    *filename;
    bool    recorded;      /* 0 = do not permanently record */
    int     handle;        /* file handle, 0 = file closed          */
    char    *guideData;    /* program description, title, times     */
    time    startTime;     /* actual record start time              */
    time    stopTime;      /* actual record stop time          */
    int     startNPT;      /* start NPT for the media content instance*/
    int     stopNPT;       /* stop NPT for the  media content instance*/
    int     tsbHandle      /* handle for associated TSB          */
    int     tsbStartNPT;   /* start NPT for associated TSB      */
    int     tsbStopNPT;    /* stop NPT for associated TSB      */

    /* additional data */

};
```

410 — char *filename;
415 — bool recorded;
420 — int handle;
425 — char *guideData;
425 — time startTime;
430 — time stopTime;
435 —
437 — int startNPT;
440 — int stopNPT;
445 — int tsbHandle
450 — int tsbStartNPT;
455 — int tsbStopNPT;

FIG. 4A

```
struct TSBprogramInfo
{
    int    handle;        /* file handle, 0 = file closed    */

    List  programs;       /* list of ProgramInfo              */

    int    startNPT;      /* start NPT for the TSB           */

    int    recNPT;        /* current record NPT for the TSB */

    /* additional data */

};
```
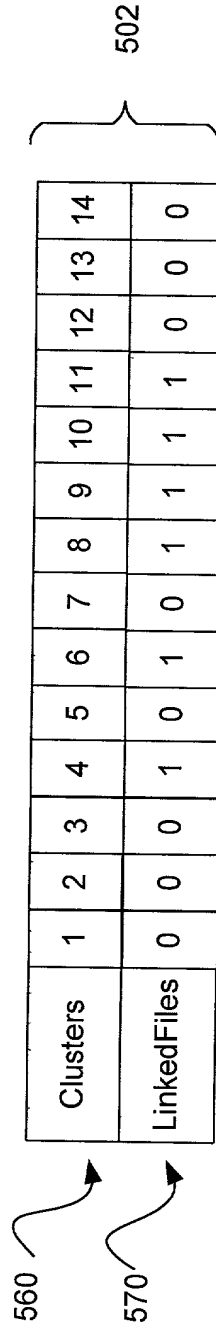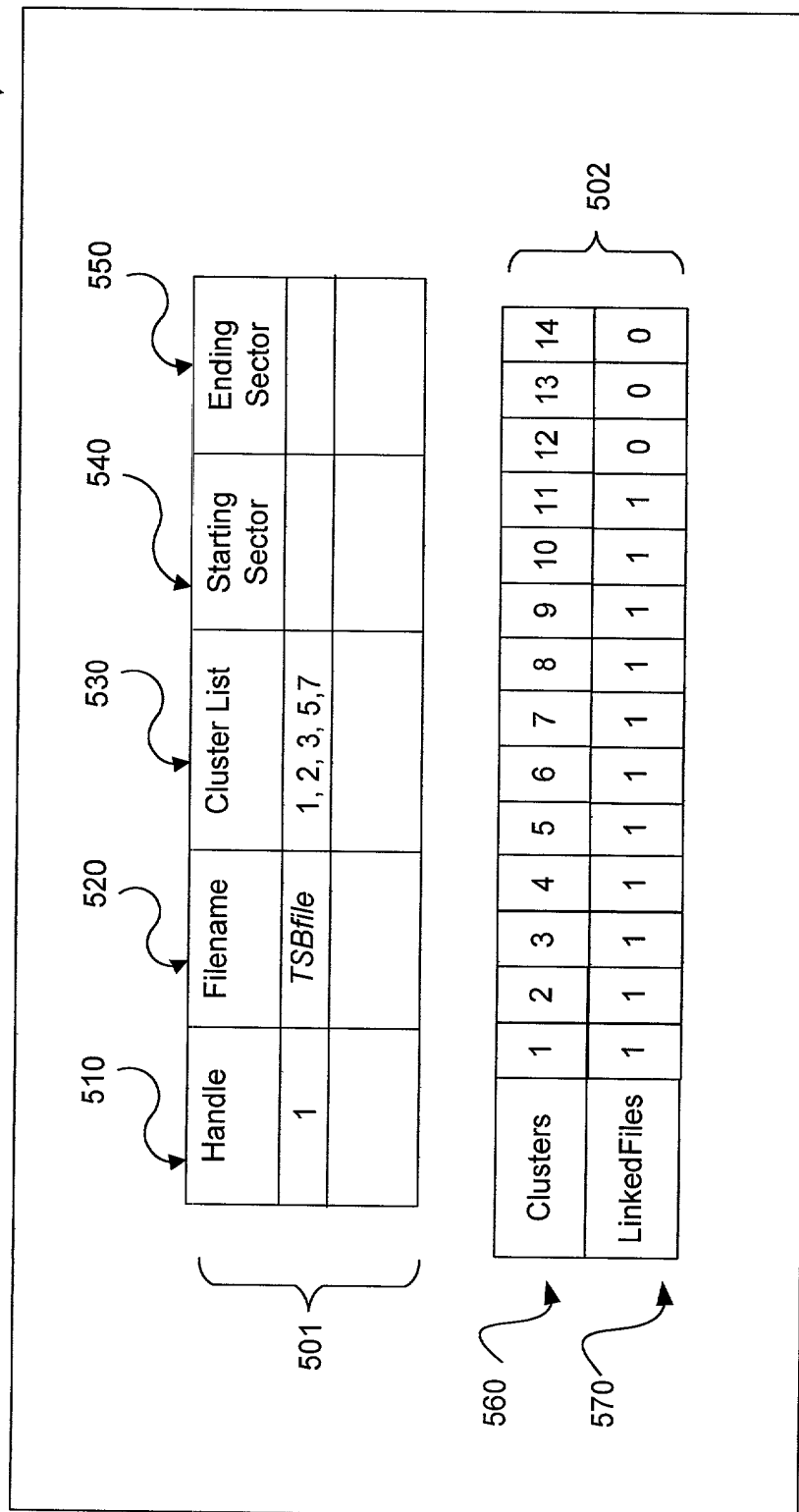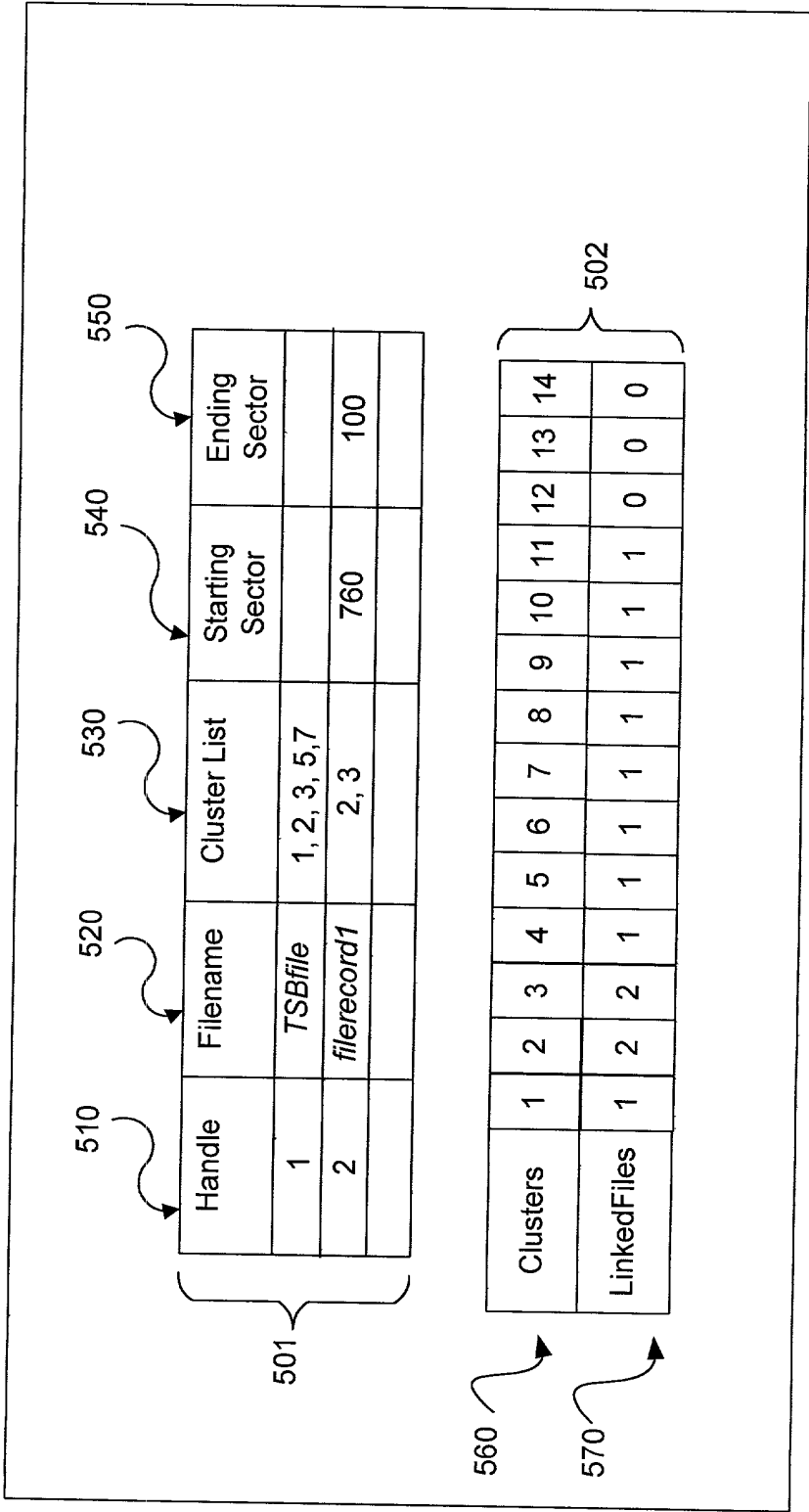
460
465
470
475

FIG. 4B

Handle	Filename	Cluster List	Starting Sector	Ending Sector

501

Clusters	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LinkedFiles	0	0	0	1	0	1	0	1	1	1	1	0	0	0

502

560

570

500

FIG. 5A

500

501

Handle	Filename	Cluster List	Starting Sector	Ending Sector
510	520	530	540	550
1	TSBfile	1, 2, 3, 5, 7		

502

Clusters	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LinkedFiles	1	1	1	1	1	1	1	1	1	1	1	0	0	0

560

570

FIG. 5B

500

Handle	Filename	Cluster List	Starting Sector	Ending Sector
1	TSBfile	1, 2, 3, 5, 7		
2	filerecord1	2, 3	760	100

501

510 520 530 540 550

Clusters	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LinkedFiles	1	2	2	1	1	1	1	1	1	1	1	0	0	0

502

560
570

FIG. 5C

Handle	Filename	Cluster List	Starting Sector	Ending Sector
1	TSBfile	12, 2, 3, 5, 7		
2	filerecord1	2, 3	760	100

510 520 530 540 550

501

Clusters	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LinkedFiles	0	2	2	1	1	1	1	1	1	1	1	1	0	0

560 570

502

FIG. 5D

500

500

Handle	Filename	Cluster List	Starting Sector	Ending Sector
510	520	530	540	550
1	TSBfile	12, 13, 3, 5,7		
2	filerecord1	2, 3	760	100

501

Clusters	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LinkedFiles	1	1	2	1	1	1	1	1	1	1	1	1	1	0

502

560

570

FIG. 5E

500

501

Handle	Filename	Cluster List	Starting Sector	Ending Sector
1	TSBfile	12,13,14,5,7		
2	filerecord1	2, 3	760	100

510 520 530 540 550

502

Clusters	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LinkedFiles	1	1	2	1	1	1	1	1	1	1	1	1	1	1

560

570
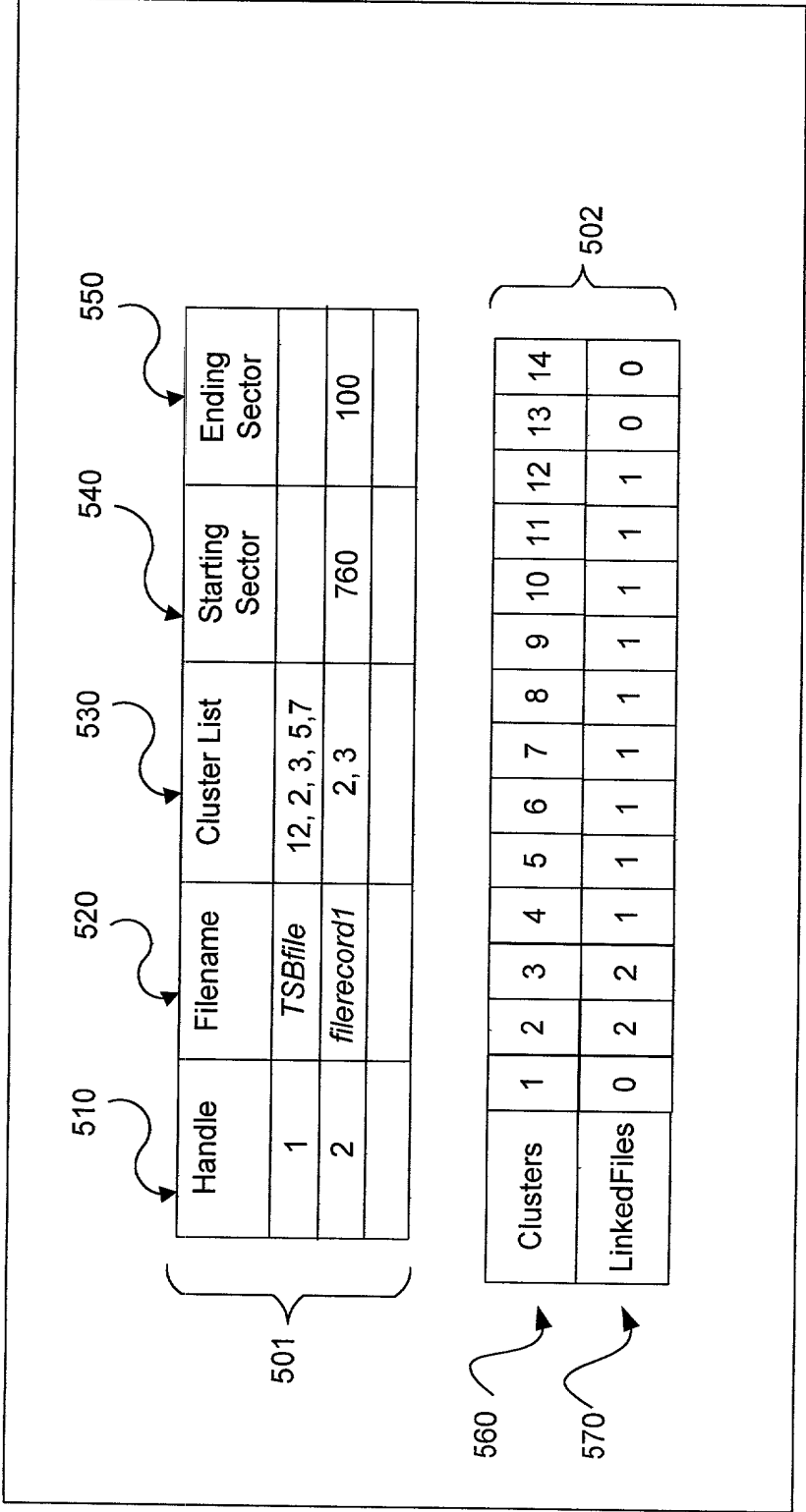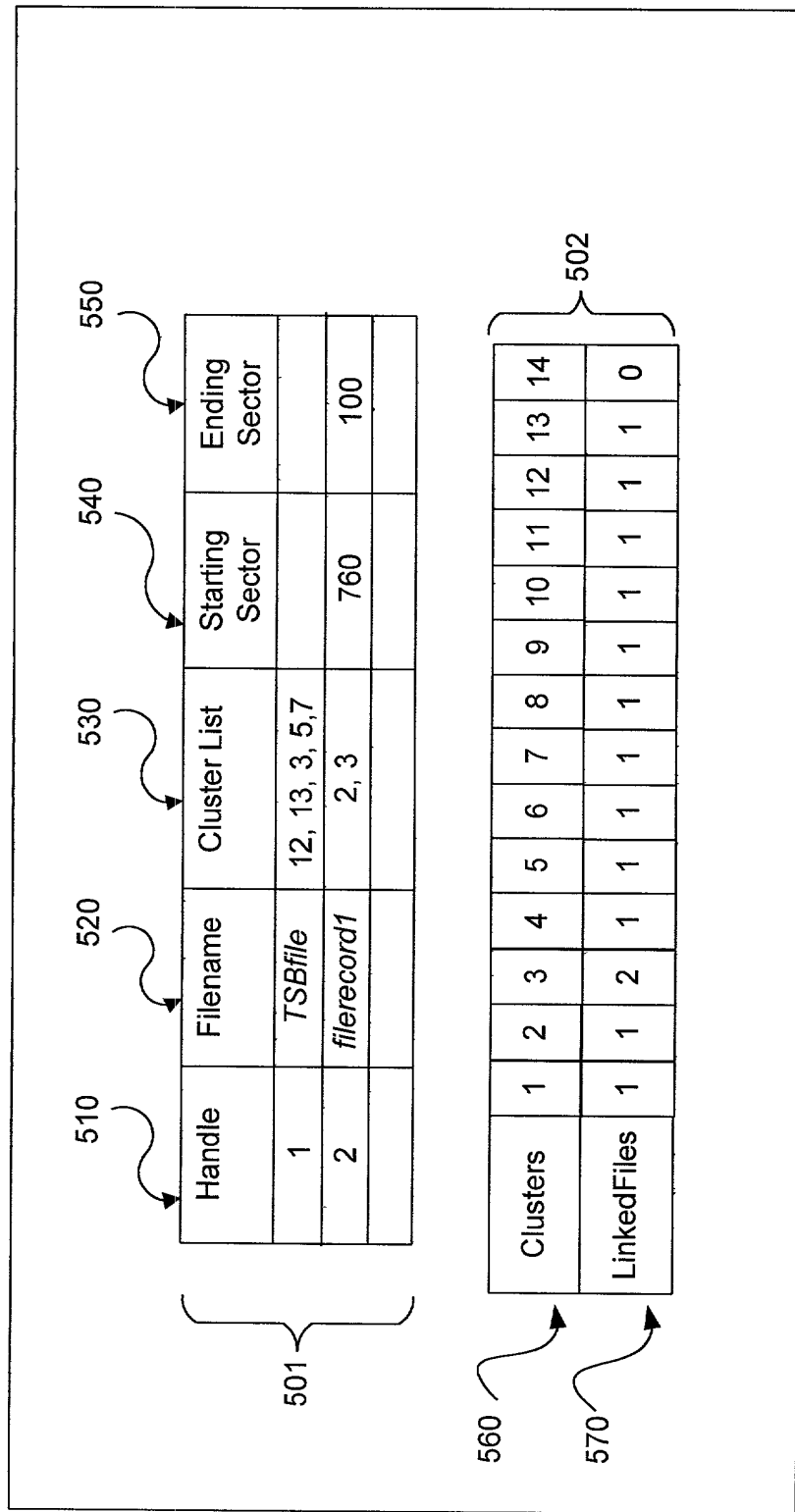
FIG. 5F

```
struct clusterInfo        /* cluster entry data in FAT */
{

    short numLinkedFiles;        /* number of linked files */
    /* additional data */

}
```

FIG. 6A

```
struct RecordedFileInfo
{

    ClusterList clusterList;    /* ordered list of clusters */
    unsigned  startingSector;
    unsigned  endingSector;
    /* additional data */

}
```

FIG. 6B

```
struct TSBfileInfo
{

    ClusterList clusterList;        /* ordered list of clusters

    /* additional data */

}
```

FIG. 6C

void dvrm_TimeShift (ui32 *handle, TV_ID tvId)

FIG. 7A

dvrm_Record (ui32 *handle, TV_ID tvId, char *filename, eDvr_Quality quality)

FIG. 7B

dvrm_TimeShiftRecord (ui32 *handle, ui32 *tsbHandle, char *filename, i32 startNpt, i32 stopNpt)
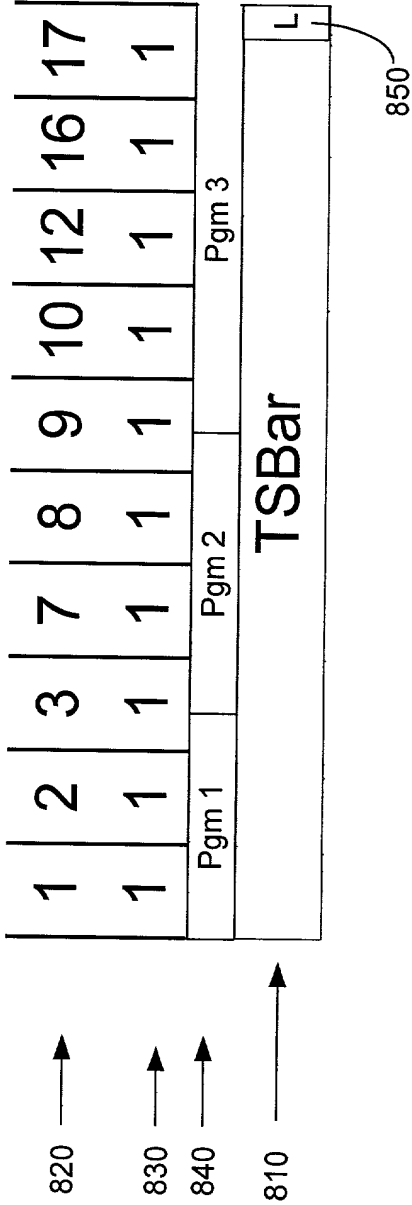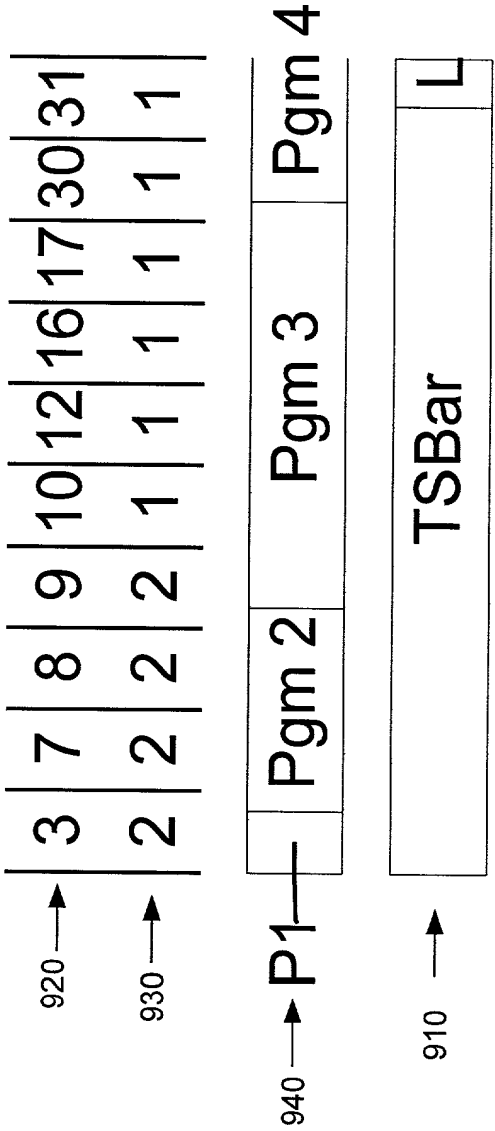
FIG. 7C

1	2	3	7	8	9	10	12	16	17
1	1	1	1	1	1	1	1	1	1

Pgm 1   Pgm 2   Pgm 3

TSBar

L

820

830

840

810

850

FIG. 8A

	2	3	7	8	9	10	12	16	17	30	
	1	1	1	1	1	1	1	1	1	1	

830 →

P 1	Pgm 2	Pgm 3	Pgm 4

840 →

TSBar	L

850

810 →

FIG. 8B

3	7	8	9	10	12	16	17	30	31	
1	1	1	1	1	1	1	1	1	1	1

P1

	Pgm 2	Pgm 3	Pgm 4

TSBar	L

FIG. 8C

3	7	8	9	10	12	16	17	30	31
920 →

2	2	2	2	1	1	1	1	1	1
930 →

940 → P1 —

Pgm 2	Pgm 3	Pgm 4

910 →

TSBar	L

FIG. 9A

3	7	8	9	10	12	16	17	30	31	34
1	2	2	1	1	1	1	1	1	1	1

Pgm 2	Pgm 3	Pgm 4

TSBar	L

FIG. 9B

3	7	8	9	10	12	16	17	30	31	34	35
1	1		2	2	1	1	1	1	1	1	1

Pgm 2	Pgm 3	Pgm 4

TSBar	L

FIG. 9C

3	7	8	9	10	12	16	17	30	31	34	35	36
1	1	1	1	1	1	1	1	1	1	1	1	1

Pgm 2	Pgm 3	Pgm 4

TSBar	L

FIG. 9D

3	7	8	9	10	12	16	17	30	31	34	35	36	37	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Pgm 2		Pgm 3		Pgm 4		Pgm 5

TSBar	L

FIG. 9E

FIG. 10A

1070

Pgm 1 | Pgm 2 | Pgm 3

TSBar

L

FIG. 10B

Receive event notification that TSB is going to shift and update starting location of TSB — 1005

Invoke a driver API to retrieve status of current playback position — 1025

Current playback NPT < shifted TSB start NPT? — 1035

NO

Playback continues from the TSB — 1037

YES

Find active recorded file that contains the current playback NPT — 1045

Invoke driver API to make recorded program file the active playback file — 1055

FIG. 10C

dvrm_Status (ui32 handle, *i32 npt, sDvr_Scale *scale, ui32 *mode)

FIG. 10D

void dvrm ConvertPlay (ui32 tsbHandle, ui32 handle)

FIG. 10E

3	7	8	9	10	12	16	17	30	31	34	35	36
1	1	1	3	2	2	2	2	1	1	1	1	1

Pgm 2	Pgm 3	Pgm 4

TSBar	L

FIG. 11A

FIG. 11B

3	7	8	9	10	12	16	17	30	31	34	35	36	37	38
1	1	1	2	1	2	2	2	1	1	1	1	1	1	1

Pgm 2	Pgm 3	Pgm 4	Pgm 5

TSBar	L

FIG. 11C
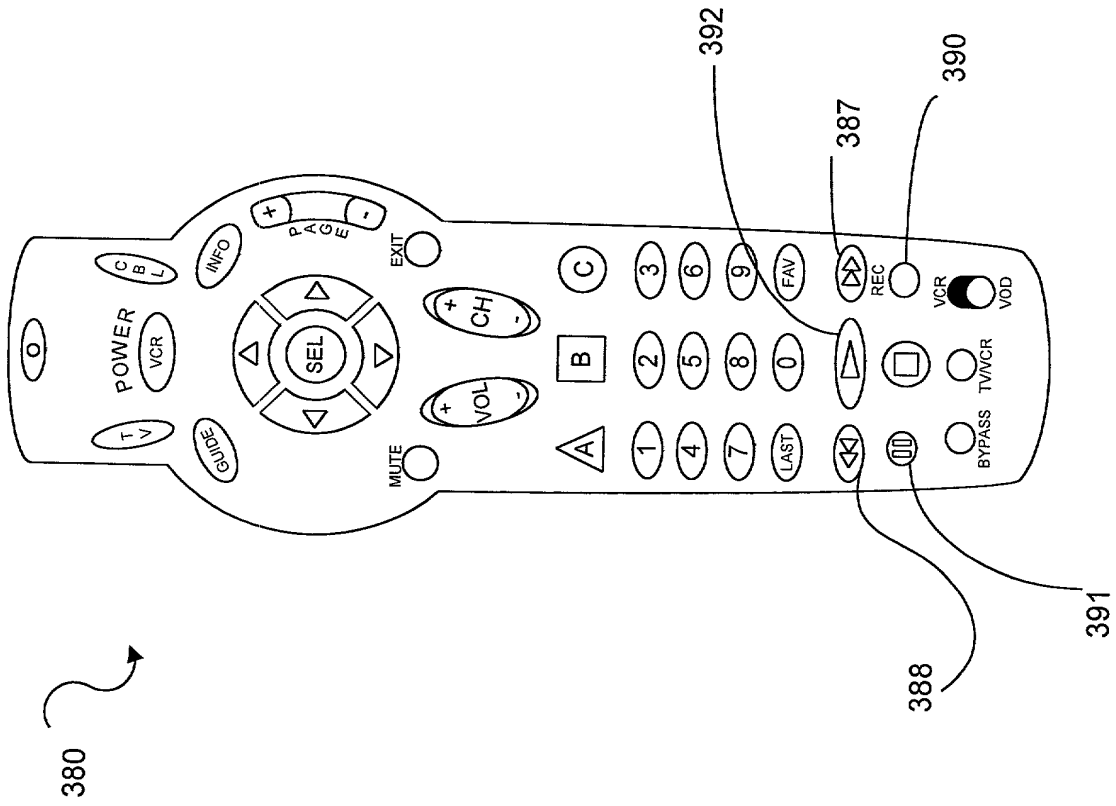
FIG. 12
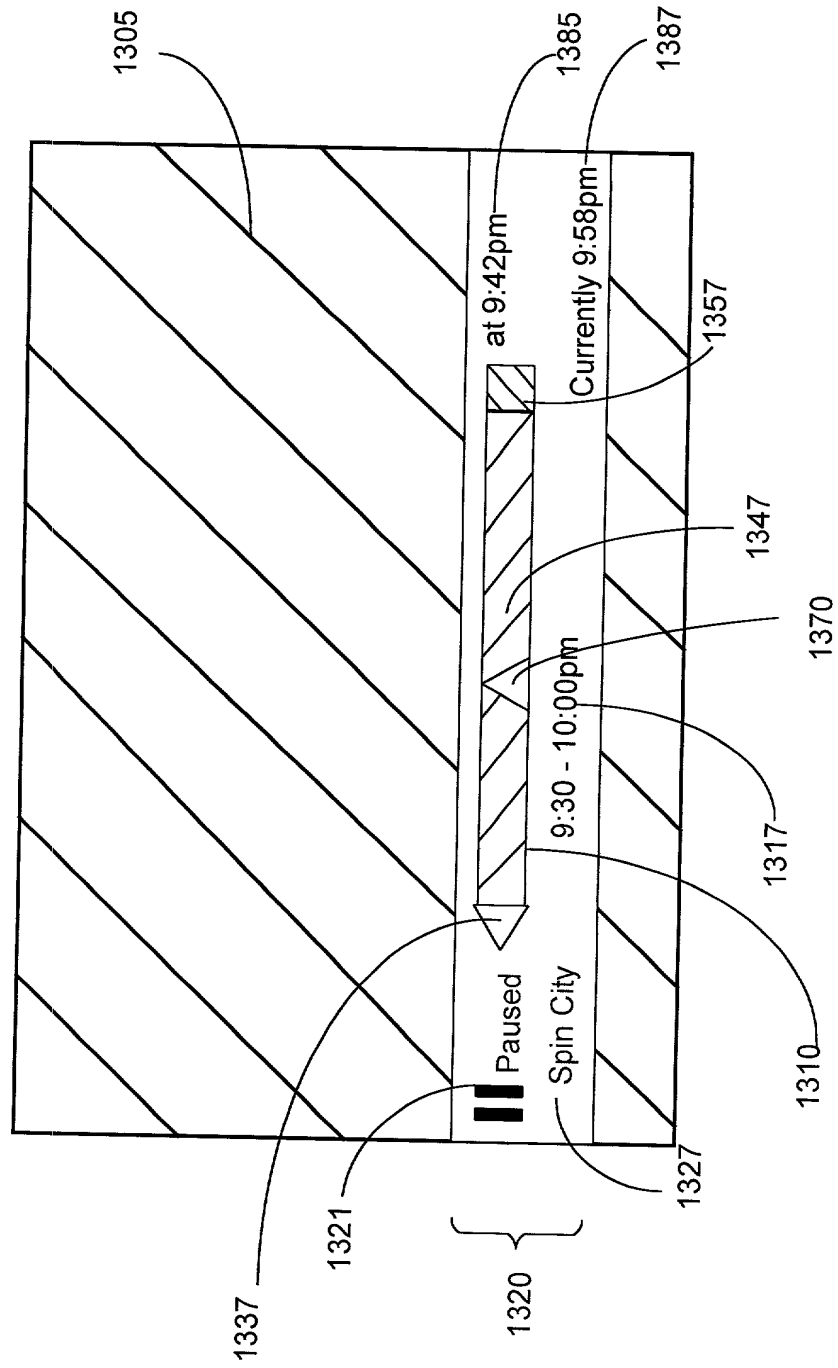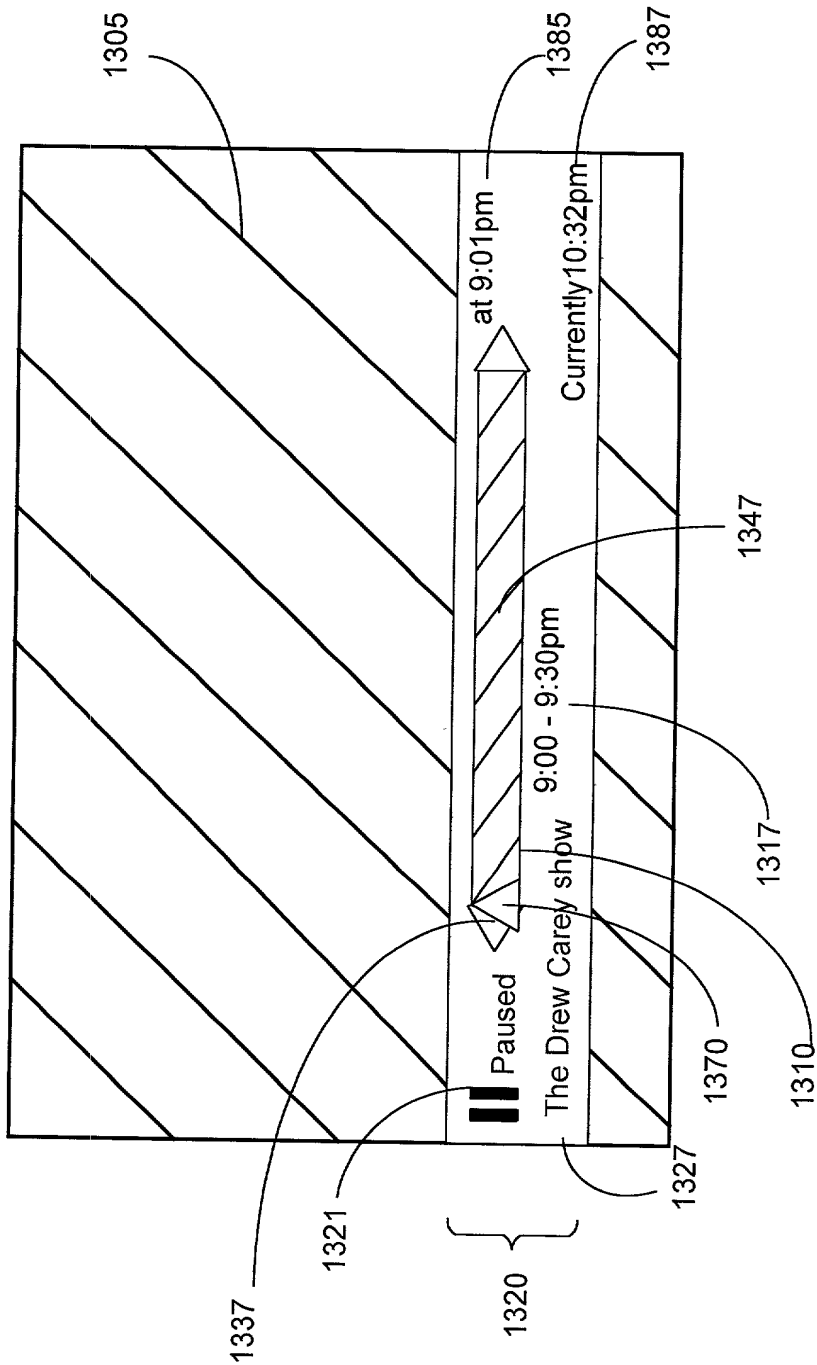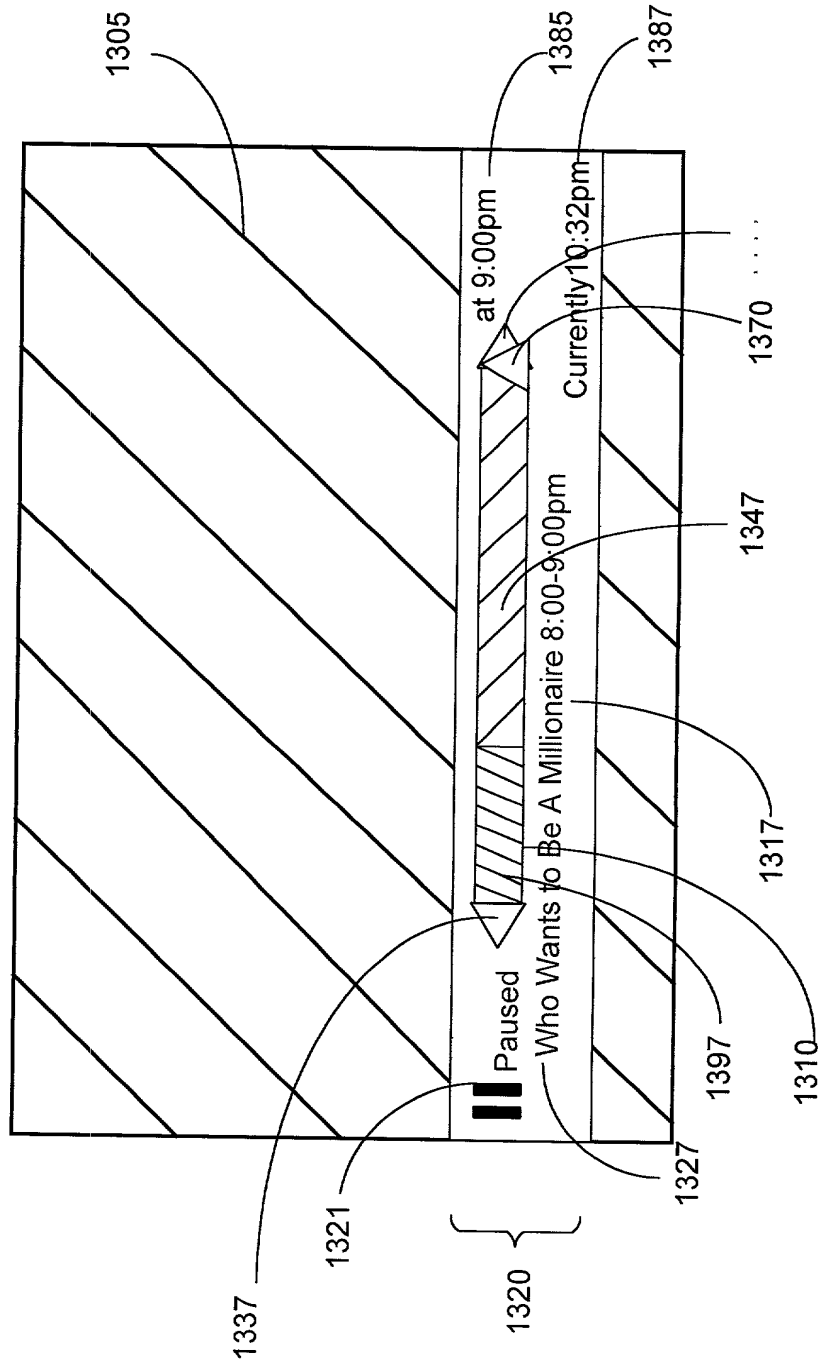
1305

1385

1387

at 9:42pm

Currently 9:58pm

1357

1347

1370

1317

9:30 – 10:00pm

1310

Paused

Spin City

1327

1321

1320

1337

FIG. 13A

1305

1385

1387

at 9:01pm

Currently10:32pm

1347

9:00 - 9:30pm

1317

The Drew Carey show

1370

1310

Paused

1327

1321

1320

1337

FIG. 13B

1305

1385

1387

1337

1321

1320

1327

1397

1310

1317

1347

1370

⏸ Paused

Who Wants to Be A Millionaire 8:00-9:00pm

at 9:00pm

Currently 10:32pm

. . . . .

FIG. 13C

1400

Insufficient Space

You need 30 min on your Explorer to record this program.

Recording Space Available: 0 hr, 14 min.

Options

Erase a Recorded Program

Save to VCR

Cancel a Scheduled Recording

SEL

Cancel

FIG. 14